

Technical Report – Cover Page

BIRD Ref. No.: 3024

To: The Israel – United States Binational Industrial Research and Development Foundation

Project Title: **First Responders Emergency Radio Repeater System for Existing High-Rise Buildings**

Submitted By:

Israeli Company: HiRise Tech Ltd

U.S. Company: Allstate Sprinkler Corp.

Type of Report: Interim

Project Start Date: September 1, 2018

Dates of Reporting Segment Covered: from 01/09/2018 to 28/02/2019

Project Manager:	Israeli Company	U.S. Company
Signature	_____	_____
Printed Name	<u>Itsick Ben Tolila</u>	<u>Dan Friedman</u>
Title	<u>CEO</u>	<u>COO</u>
E-mail:	ibt@highrisetechnology.com	dan@allstatesprinkler.com
Telephone no.:	+972-54-3681831	_____

Authorized Company Official:

Signature	_____	_____
Printed Name	<u>Itsick Ben Tolila</u>	<u>Dan Friedman</u>
Title	<u>CEO</u>	<u>COO</u>
E-mail:	ibt@highrisetechnology.com	dan@allstatesprinkler.com
Telephone no.:		

Date Submitted: 02 April 2019

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2. Objectives –

State the overall objectives of the project and of the work performed during the segment covered by the report, as defined in the project proposal or in approved changes to the development program plan.

Following the attack on the World Trade Center (9/11), a mission crucial need for effective and reliable wireless communications among First Responders within high-rise buildings became quite apparent. A number of detailed recommendations from major studies have become regulatory requirements.

To comply, owners of tens of thousands of high-rise buildings in the United States will be required to deploy a system which provides comprehensive radio coverage for First Responders. The HiRiseTech Ltd. patented invention for a First-Responder Radio System (herein: FRRS) fully meets all NFPA Fire Code¹ (NFPA 1221®) recommendations and New York City Buildings Department requirements while being a cost-effective and simply-to-deploy solution.

The project objectives are to develop and deploy a patented invention for FRRS which is modular and customizable for installing in an existing high-rise building without major investments in construction and infrastructure. First Responders will be able to continuously and reliably maintain communications from any point of any floor, no matter how high or complex the building is, and during any type of emergency –and **their LOCATION at any point in the building is accurately known and displayed.**

The Israeli Partner, HiRiseTech Ltd., the owner of the patented technology has considerable hands-on experience. The U.S. Partner, Allstate Sprinkler corp., will be engaged in the characterization of the system involving market requirements, qualification and certification of the regulatory requirements including a pilot project in a high-rise building in New York City, marketing, implementation, and support, as part of the BIRD project. BIRD project enabled the Israeli and the American partners to commence the development of a product specifically designed for existing buildings that require upgrading from the antiquated Fire Fighters Telephone system that has been installed since the beginning of the 20th century. The new system being developed is in conformance with all the requirements of the appropriate governing bodies. Such a Retrofit has distinct advantages in that it makes effective use of an already-existing infrastructure which is protected against heat and flames. The required substructure is minimal, and installation is fast, simple, and relatively cheap. This concept has attracted the attention of several large companies and the potential market size can reach hundreds of billions of dollars.

During the first project segment covered by this reports the company not only achieved the technical milestone of completing the design and writing of the system requirement specification (Task 1) and major fraction of the development of the system components (Use Interface, Task 2) but conducted major achievement toward product implementation and marketing in New Nork City and the USA (Task 8) as described below

1. Evaluation of the existing high rise building with existing infrastructure for first responders that requires up-grade, both in the USA at large and in New York City in particular
2. A User Requirement analysis was conducted with all stakeholders, especially the Fire Department of New York (FDNY) who are the authority that has the Jurisdiction over New York City
3. Accordingly, the parties prepared the Marketing Requiring Document (MRD) that defines the market, its channels and decision making, the suitable required solution, market penetration, etc. Using this document the engineers of HiRiseTech can now translate the MRD to work plan

¹ National Fire Protection Association.

and adjust the System Operation (SOW) and the technical framework for the FRRS product and all its components. The results will be Technical Specification and development plan for the entire system and its components which will facilitate the product development and pilot implementation

Accordingly, the two partners see a very positive future to complete the project in time and according to budget as proposed to the BIRD foundation.

The BIRD project will shorten the product time to market and will answer a crucial need in the American and international market, and the parties are dedicated to leverage this opportunities to progress rapidly according to their business plan.

3. Summary of Accomplishments –

Provide an informative summary of the methods, results and accomplishments of the development work conducted in the period covered and compare the actual accomplishments with the objectives stated in Section 3 above. The summary should be self-sufficient and understandable to someone who reads nothing else in the report.

The project has started in September 1st when the companies completed the agreement between them and submitted it to the BIRD Fund, following the completing of the tri-lateral agreement between the companies and the BIRD- Fund and the installment of the first advance for starting the project. Prior to this stage each company participated in its respective country in the BIRD seminar of management and reporting. In addition, the project leaders of AllState Sprinklers, the American Partner, have participated in the BIRD Seminar for First Responders and presented the project to an audience of stake holders and peers, which gained lots of attention

In terms of Project developing the first six months of the project focused on:

- Completing Task 1 of Developing the system requirement specification (SRS) with all the technical documents as detailed in the task activity description
- Reach an advanced development level of the developing the FRRS remote unit (RU). This task is partially completed as detailed in the task activity description.
- Pursuing Task 8 of marketing with regards to sub-task 8.1 - market survey and sub-task 8.2 - Customer requirements and reaching certification of individual operators and permit for installing the FRRS in existing high rise building in the city of New York.

The completion of the MRD as included in Task 8 enabled HiRiseTech to complete the fine tuning design of the RU (Task 2) and of the CCU (Task 3). In addition, HiRise Tech completed the development of the specification document, and of the Top-Down design and development of the end user component (RU) including all the required software and hardware. These developments are not only bringing the task to a full completion of task 2 but also enabled the completion of the RU to enter into the final RU manufacturing towards the final stage required for manufacturing for the Pilot (Task 6).

Based on the combined MRD HiRiseTech developed additional documents:

- 1) Technical Spec. for the system overall and
- 2) Technical Spec. for each of the components (CCY, RU) (Task 1).
- 3) The completion of the specification documents has led to the full development plan of the end user component (RU), and the top-down complete design of software and hardware.

These developments are bringing the development of the remote unity (RU) to completion including hardware and software elements, and is now entering into the final RU manufacturing towards supplying these multiple units for incorporation n the Pilot (Task 6).

This summary reflects a precise follow up on the initial GANTT for project development as a cooperative efforts of the Israeli and the USA partners and the timely achievement of respective milestone 1. Furthermore, for Task 8 the company accomplished beyond the expected achievement as planned initially.

On the AllState Sprinkler side the completion of the MRD reflect the company deep learning and analysis of the New York City high rise building of old infrastructure that needs update, and the mapping of all the stakeholders. This was very meaningful, since with the completion of the MRD document enabled AllState Sprinkler to complete all the information that was taken by HiRise Tech to enable the hardware engineers and software developers of HiRise Tech to make a significant leap jump in their work to complete Task 2 and reach 50-80% completion of Task 3.

On the AllState Sprinkler side, the completion of the MRD, and the participation of the Company Chief Engineer in the specific New York Department Specialist Program enabled him to obtain the accreditation by the New York Fire Department for him in person, meeting the first requirement for the company from the authorization entity. This was followed by the accreditation and certification of the company to perform the FRRS system in high rise building in New York City.

4. Results –

Describe, with reference to the Program Plan submitted in the project proposal (see also Annex D of the CPFA), the results obtained during the reporting segment on an activity-by-activity (task-by-task) basis. Identify and describe results that represent significant variations from the Program Plan. Discuss any activities/tasks that may have been eliminated or added to the Program Plan during the reporting period and give the reasons for such changes. Indicate how such modifications will affect the nature of the product being developed in terms of features, specifications, performance, marketability, time-to-market, etc.

The Project follows the original and updated GANTT Chart Status according to the graphical Work Breakdown Structure, as depicted in section 6.

Project breakdown to tasks appears in the table below.

Task No.	Description	Duration in Months	Start Month	End Month
1	Development of System Requirement specification (SRS)	3	9/2018	12/2018
2	Design & Development of Remote Unit (RU)	7	02/2019	8/2019
3	Design & Development of Central Control Unit (CCU)	9	4/2019	12/2019
4	Lab Integration and Validation of Prototype system	5	12/2019	05/2020
5	Pilot in high-rise building in NYC	5	03/2020	08/2020
6	System Qualification and Certification	5	03/2020	08/2020
7	Development of Voting and Positioning algorithms	12	4/2019	5/2020
8	Marketing, Training & Lobbying Efforts	23	10/2018	8/2020
9	Management, Administration and Financial governance	24	9/2018	8/2020

General Status:

Task 1 marked strong yellow has been completed in full.

Task 2 and its sub-tasks were partially performed at 80-25%

The parties are in the process of developing task 3 with Top Down design already in place.

Important Sub-tasks of Task 8 (including 8.1, 8.2, 8.3) were also accomplished:

Task 1: Development of the system requirement specification

Period: September 2018 to December, 2018

Leader: HiRiseTech (HRT) and Allstate Sprinkler Corp. (ASS)

Objective: Completion of an agreed system requirement specification (SRS) presenting the detailed technical requirements for a complete high-rise building communications system and the proposed implementation.

Description: Based on HiRiseTech's patented technology and designed to comply with NFPA 1221 and the New York City Building Code, a system requirement specification and technical implementation proposal will be written for a flexible, adaptable, modular, and integrative radio

communications system that allows First Responder to reliably communicate from any location within a high-rise building using their personal radios, while being rapidly and economically deployed in existing and new buildings.

This task involves the detailed written specification of the system's technical requirements, including its various constituent units, controls and indicators, power distribution, wireless transmission, operating modes and functions, communication protocols, and applicable regulatory requirements; and listing precise numerical values for parameters, such as transmission frequencies, mechanical dimensions and audio levels. The task also involves the development of a top-down description of the proposed hardware and software implementation, designed to meet the stated technical requirements, including the design of the specialized communication protocols required for carrying the digitized information over the existing building wiring. The system requirements specification is subjected to a System Requirements Review (SRR), in which the specifications are analyzed and discussed by the parties, and necessary improvements made, before the documents become the agreed and binding specification governing the system design.

Responsible parties:

HiRiseTech: Itsick Ben Tolila- CEO, Gadi Shirazi - R&D Manager

Allstate Sprinkler Corp.: Dan Friedman - COO, Peter Burgess - Engineering lead.

Milestone 1: Completion of an agreed SRS document.

Sub Task 1.1: “Overall System Design Spec., based on the Marketing Requirement Doc “:

HiRiseTech has prepared (enclosed) the System Design Spec. (SDS) based on the Marketing Requirements Document (MRD) (See Task 8 description) as was prepared by AllState, which describes the need for a retrofit solution, targeting the existing market of high rise buildings in NYC (Retrofit Solution).

The SDS actually “translate” the market identified needs into technical & engineering requirements which define the technical characteristics of the required system.

Status: Done (100%)

Sub task 1.2: “Central Control Unit (CCU) Technical Spec. “:

HiRiseTech has developed the Technical Specification document for the main element of the system: the CCU.

The Technical spec for the Sub-system is derived from the SDS, while elaborating specifically the functionality and the technical characteristics of the CCU.

The Document serves as the design guidelines for the engineers who are involved in the development of the unit based on Technical Spec Document.

Status: Done (100%)

Sub Task 1.3: “Remote Unit (RU) Technical Spec. “:

HiRiseTech has developed the Technical Specification document for the Remote Unit (RU), this Sub-system is the element which will be installed in every floor while taping to the existing infrastructure (pair of wires).

The Technical spec. for the Sub-system is derived from the SDS, while elaborating specifically the functionality and the technical characteristics of the RU.

The Document serves as the design guidelines for the engineers who are involved in the development of the unit based on Technical Spec Document.




Status: Done (100%)

Sub-Task 1.4: "SRS Doc. approved ":

The aforementioned Technical specification (System, CCU, RU) were discussed and evaluated during a phase of Design Review held in HiRiseTech, and after a phase of implementing remarks and technical adjustments, the documents were approved.

Status: Done (100%)

The three technical documents associated with this task are enclosed:

Spec doc of RU	Spec Doc CCU	Spec Doc FRRS Retrofit
 RU Tech Spec draft 1 doc.(1)	 CCU Tech Spec draft doc.(1) 1	 FRRS Retrofit System Design Spec c

Cost attributed to this task:

HiRiseTech

Personnel

Itsick Ben Tolila	Communications Engineer	2018
Gadi Shirazi	Communications Engineer	6838
Buni Nutman	Operation and Marketing	
Meir Sasson	Communications Engineer	2012
Hila Cohen	Software Engineer	0
Shlomi Schwartz	Mechanical Engineer	493
Eddy Maidanick	Software Engineer	2959
David Drory	RT Embedded Engineer	2762
	Total	17,082
	OH	4,271
	Total + OH	\$21,353

Trip Abroad to New York

Itsick Ben Tolila- SRS STP review, MRD, integration plan – **\$3,795**

Consultants:

Haim Kalosh – Design of RF in Buildings 10,595

Hamutal Meiri, TeleMarpe – structuring the SRS - 2,696

Sagiv Weiss, Standards 800

Total \$14,091

Financial Report for HiRiseTech in Task 1 \$39,239

5% G&A \$1,961.95

Total Task 1 41,200.95

Planned budget for Task 1: \$29,613

AllState Sprinkler

Personnel

Adam Goodrich	Director of Installation	2,458.00
Dan Friedman	Director of Operation	2,500.00
Gino Vulaj	Project Manager	6,001.00
Felix Rudiak	Engineering/Project Management	4,540.00
Peter Burgess	Field Engineer	2,011.00
Nicole Doniere	System Installer	3,210.00
	Total	20,720.00
	25% OH	5,180.00
	Total +OH	25,900.00

5% G&A **1,295**

Total Financial Report for HiRiseTech in Task 1 **\$27,195**

Planned budget for Task 1: **\$25,890**

Task 2: Remote Unit Development

Period: October 2018 to April 2019

Leader: HiRiseTech.

Objective: Design and development of the Remote Unit.

Description: The detailed design and development include the hardware and the embedded software, including the wireless transceiver, antenna, data modems, high-efficiency power regulators, test circuits, and the package design that will allow the remote unit to function as a tiny drop-in unit that replaces an existing wall socket. The integrated test circuits monitor the operation of the various elements and report any malfunctions in the Central Control Unit. The units will be designed for equal sharing of radiated power between the floors of the building.

The units will be designed to enable the Central Control Unit to rapidly and automatically perform Remote Unit software upgrades through the connecting cable, thereby avoiding the need for maintenance personnel to access the Remote Units on a floor-by-floor basis.

Responsible parties:

HiRiseTech: Mr. Gadi Shirazi, R&D Manager, Mr. Edward Maidanick, Software Engineering Manager

Allstate Sprinkler Corp.: Peter Burgess, Engineering lead

This task has only partially completed and anticipated to end only in April 2019 by reaching the milestone of Completion the assembly and testing of remote unit prototype.

So far the hardware and embedded software were developed and the other components are on the road

Task 2.1: “Remote Unit Hardware Development”:

Based on the approved Technical Spec. of the Remote Unit, the Hardware engineers have started to develop the unit hardware, this includes: Design concept, benchmark & decision regarding the relevant technologies such as modems, Zero IF transceivers, baseband processors, power over cooper wires etc.

The design is extremely complicated while facing constrains such as power dissipation, size, power consumption, meeting FCC standards, handling four extremely close UHF frequencies while using only one Antenna etc.

Status: 80% completed

Task 2.2: “Remote Unit Software Development”:

Based on the approved Technical Spec. of the Remote Unit and the Hardware design of the RU the Software engineer has started to develop the Software for the RU. Top level design of the software structure and procedures and required Device Drivers (Board support Package) were completed.

This includes Bring Up of development environment (Compiler, debugger, Emulator etc.) and coding of the Board Support Package (BSP), based on the designed Hardware interfaces.

Status: 20% completed

Task 2.3: “Variable Coupler Development”:

Based on the approved Technical Spec. of the Remote Unit and the Hardware design of the RU, the design of the variable coupler have started , the variable coupler enables to control the amount of RF power injected from each outlet in each floor. This element will be embedded within the total mechanical and Hardware design of the RU.

Status: 15% completed

Task 2.4: “Tiny Diplexer (Digital) Development”:

Based on the approved Technical Spec. of the Remote Unit and the Hardware design of the RU, the design of the Tiny Diplexer has started, the Tiny Diplexer handle the entire RF Front End of rise the Remote Unit (Two Receivers and two Transmitters connected to one antenna).

The implementation of the Tiny Diplexer will be based on SAW (Surface Acoustic Waves) technology, HiRiseTech intend to work with a Korean sub-contractor who is expert in this field in order to develop and manufacture four unique and proprietary SAW filters.

This element will be embedded within the total mechanical and Hardware design of the RU.

Status: 55% completed

Cost attributed to this task:

HiRiseTech

Personnel

Itsick Ben Tolila	Communications Engineer	7,300
Gadi Shirazi	Communications Engineer	12,100
Buni Nutman	Operation and Marketing	10,160
Meir Sasson	Communications Engineer	27,402
Hila Cohen	Software Engineer	15,200
Shlomi Schwartz	Mechanical Engineer	3,804
Eddy Maidanick	Software Engineer	55,341
David Drory	RT Embedded Engineer	27,853
	Total	159,160
	OH	39,790.00
	<u>Total + OH</u>	<u>198,950.00</u>

Material and Supplies **\$701**

Financial Report for HiRiseTech in Task 2 **\$ 199,651.00**

5% G&A \$ 9,982.55

Total HiRise Teck **\$209,633.55**

Planned budget for Task 2 **\$ 197,247**

AllState Sprinkler

Personnel

Dan Friedman	Director of Operation	0
Gino Vulaj	Project Manager	2315
Felix Rudiak	Engineering/Project Management	6,301
Peter Burgess	Field Engineer	7403
Nicole Doniere	System Installer	8520
	Total	24,539.00
	25% OH	6,134.75
	Total +OH	30,673.75

Material and Supplies

System Infrastructure elements **10,866**

Financial Report for HiRiseTech in Task 2 **\$41,539.75**

5% G&A \$ 2,076.99

Total Financial Report for HiRiseTech in Task 2 **\$43,616.74**

Planned budget for Task 2: **\$37,144**

Task 3: Development of the Central Control Unit (CCU)

Period: January 2019 to August 2019

Responsible party: HiRiseTech

Objective: Design and development of the Central Control Unit (CCU).

Description: The detailed design will include HW, SW, RF, modems, power, and mechanical detailed design.

The development will provide the modes of sleep/standby/on operation and handling of all RF communication for audio, command and control along with the management of multiple RUs in different floors, transmission/communication protocols, control and command in real time for all RUs, positioning of estimated remote unit localization in real time and the configuration of multiple parallel real time communication with minimal latency. The CCU unit will be designed and developed to enable the delivery of information to the Control Consoles and the integration of the LCD display for caller identification and positioning within the building suitable for two separate firefighting teams. The development will check self-testing of all system elements by automated or manual control.

The development of the CCU will check the operating power to the Command Console and RUs and the speech connections between the firefighter team members according to signals from the CCU and RU. HiRiseTech will check the monitoring, controlling and exchanging of digitized speech data with the RU, data analysis with multiple RUs and caller localization. The encoding/decoding APCO P25 caller identification is built to support the distribution of ID information to all call recipients. The CCU is designed to support up to four connected Command Consoles, two of which are allocated to two incident commanders in control of separate firefighting teams, with an optional additional pair of back-up consoles for use when access to the regular commander's positions is prevented by fire and smoke (Redundancy).

Task 3.1 and Task 3.2: Development of the CCU software and Hardware

Based on the approved Technical Spec. and of the MDR (see Task 8 below) a complete Top Down design of the CCU was conducted including both hardware and software. From this design the CCU will be built and testes.

Status: 20% completed

Cost attributed to Task 3:

HiRiseTech

Personnel

Itsick Ben Tolila	Communications Engineer	3,200
Gadi Shirazi	Communications Engineer	3,186
Buni Nutman	Operation and Marketing	2,004
Meir Sasson	Communications Engineer	4,501
Hila Cohen	Software Engineer	4,240
Eddy Maidanick	Software Engineer	5,000
David Drory	RT Embedded Engineer	4,000
	Total	26,131
	OH	6,532.75
	<u>Total + OH</u>	<u>32,663.75</u>

Budget spent for Task 3	\$ 32,663.75
5% G&A	\$ 1,633.19
Total Financial Report for HiRiseTech in Task 2	\$34,296.94
Total Budget for Task 3	\$254,752.00

Note: very early stage for this task development

Task 8: Marketing, Training and Lobbying

Period: December 2019 to August 2021

Leaders: Allstate Sprinkler Corp. and HiRiseTech

Objectives: Ensuring successful dissemination of information and exploitation of the project results to decision-makers and users in a variety of vertical markets. An additional key objective is the extension of the fundamental technological knowhow and capabilities developed during the project to spin-off applications. These objectives will be achieved through the development and implementation of a marketing and training program.

Task description: This task involves the creation of tools and methods for selling the developed solution to stakeholders in the area of fire alarm markets, including regulatory bodies, fire departments and owners of existing high-rise buildings. We will employ automated test equipment and procedures in order to train and serve the different VARS in the interests of future smooth installation. This effort will include the various hardware components, software packages, wireless units, modems, power supplies and mechanical platforms required for system installation and testing within a building. This task will demonstrate the benefits not only in terms of building a tailored solution but also in governing the direction of implementation and effective use of the solution for First Responder and addressing professional and operational concerns. Leaflets, brochures, public lectures, press releases, trade shows, and social media will all be utilized to enable information sharing with the public and professionals.

Particular attention will be given to digital marketing with the creation of a dynamic marketing website, search advancement, dedicated forums in social networks, etc.

The parties will present the various flexible solutions in professional symposia, conferences and industry exhibits.

Responsible parties:

Allstate Sprinkler Corp.: Adam Goodrich, CEO, Dan Friedman, COO.

Allstate hired Mr. Felix Rudiak, an ARCS system engineer

HiRiseTech: Mr. Buni Nutman, Marketing & PR Manager, TBD VP Sales and Marketing.

Task 8.1: Market Survey and Research

This task is on-going. During the first segment AllState Sprinkler conducted and updated market Survey that is incorporated in the updated table placed in the marketing section to this report (Page 332 Table 7)

In addition, led by the American partner, a customer survey was conducted and the feedback was included in the submission to the New York Fire Department

Status: 25%. This is an ongoing task that will be updated each segment

Task 8.2: “Preparing Market requirement Document (MRD)”

After conducting the aforementioned Survey & Research, Allstate was able to define all the requirements from the proposed system in regard to marketing aspects.

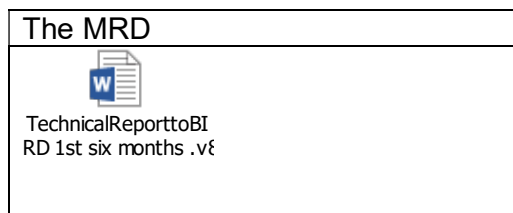
Allstate has prepared the MRD based on assumptions and the lessons learned from the survey & research process and is now able to define the characteristics of the future proposed solution intended for existing buildings equipped with old “firefighter telephone” system which addresses the old Code.

The parties cooperated in preparing the application and getting the certificate from the New York Fire Department for meeting the requirements and installing the FRRS system in existing high rise buildings.

The MRD is not a technical document but rather a descriptive document of the existing environment and it describes the proposed solution within this environment and its constraints.

The MRD was prepared in parallel to stabilizing the Technical Docs by HiRiseTech, due to the mutual investigation of the requirements by the two parties.

Status: Done (100%)



Task 8.3: “Working with Stake Holders to be familiar with the innovative solution”:

We identified the following stake holders:

- Property owners, which could be corporations or individuals, they are the solution buyers
- Property managers, which are companies that manage buildings, they are the solution recommenders, to the building boards of directors or to the owners.
- Real Estate (RE) Portfolio managers, which are individuals or companies who own a cluster of Real Estate properties. These individuals are focused in managing the portfolio financially; since they are holding the Purse strings they hold power over purchasing decisions. Particularly when it comes to finding a solution for the entire or large portions of the portfolios
- General contractors which are individuals or companies who are charged with renovations or retrofitting's or building a new. These GC's manage and create bids and RFP's and in turn send them out to the market to service providers like us.
- System Integrators – These are individuals or companies who buy our product and install it at the buildings.
- Fire Department New York (FDNY) staff – The FDNY has a crucial and dual role, which is critical to the success of the project and product.
 - First and foremost, they are by definition First responders and are the users of the solution.
 - Second, the FDNY has an enforcement arm. Once a solution of this kind becomes a matter of law then the FDNY inspects the buildings in NYC routinely and issues violations to the non-compliant building owners.

Fortunately, here at Allstate sprinkler we have a long list of people and entities we know and have access to. Including to the FDNY to who we speak to multiple times per day. We are working diligently with all of the above to introduce and discuss our solution. The task is well on its way and will continue throughout the project.

Status: Done (100%)

Task 8.4: “Working with FDNY to prepare system adopting & Certification”:

Allstate hired Mr. Felix Rudiak, as the FRRS system engineer.

One of Felix’s first tasks was to get Allstate certified for ARCS. In order to achieve that Felix had to take and pass the **FCC GROL** - General Radiotelephone Operator License (PG) Test.

The GROL has two sections, element 1 comprising of 24 questions and element 3 comprising 100 questions. The test for those two sections is taken on two separate occasions, roughly one month a part.

The above had to be completed as a prerequisite to applying to the **FCC - form 605**

After obtaining the GROL, AllState submitted the application to the FCC and the two elements of the GROL passed the GROL certificate was granted.

The next step was to file for **certificate B03** (Certificate of fitness)

Allstate Sprinkler Corp. was approved and certified, in addition Allstate is now showing as an FDNY approved ARC system provider.

This reflects the achievement of a key milestone in the project.

All certificates and applications are placed below.

Cost attributed to Task 8:

HiRiseTech

Personnel

Itsick Ben Tolila	Communications Engineer	8,475
Gadi Shirazi	Communications Engineer	2,200
Buni Nutman	Operation and Marketing	12,162
Eddy Maidanick	Software Engineer	6,000
David Drory	RT Embedded Engineer	4,000
	Total	32,837
	OH	8,209.25
	Total + OH	41,046.25

5% G&A \$ 2,076.99

Total Financial Report for HiRiseTech in Task 8 \$43,616.74

Panned Budget for Task 8 \$67,515

Note: This ongoing task will accrued expenditures in future segments

AllState SprinklersPersonnel

Adam Goodrich	Director of Installation	-
Dan Friedman	Director of Operation	2,500.00
Gino Vulaj	Project Manager	10,497.00
Felix Rudiak	Engineering/Project Management	11,720.00
Peter Burgess	Field Engineer	12,799.00
Nicole Doniere	System Installer	25,584.00
	Total	63,100.00
	25% OH	15,775.00
	Total +OH	\$78,875.00

Material and Supplies

System Infrastructure elements	\$10,866
RF Passive elements	27,441
Instillation material	10,009
Total Materials and Supplies	39,549

Domestic and trip abroad	3,050
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Financial Report for AllState Sprinkler in Task 8	\$121,474
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5% G&A	\$ 6,073.7
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Total Financial Report for HiRiseTech in Task 2	\$127,547.7
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Planned budget for Task 1:	\$413,877
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Note: This ongoing task will accrued expenditures in future segments

Below we placed certification and accreditation documents already obtained in Task 8

**Quick-Form Application for Authorization in the Ship, Aircraft, Amateur,
Restricted and Commercial Operator,
and General Mobile Radio Services**

**NOTICE TO INDIVIDUALS REQUIRED BY THE PRIVACY ACT OF 1974 AND
THE PAPERWORK REDUCTION ACT OF 1995**

We have estimated that each response to this collection of information will take on average .44 hours. Our estimate includes the time to read the instructions, look through existing records, gather and maintain required data, and actually complete and review the form or response. If you have any comments on this estimate, or on how we can improve the collection and reduce the burden it causes you, please write the Federal Communications Commission, AMD-PERF, Washington, DC 20554, Paperwork Reduction Project (3060-0850). We will also accept your comments via the Internet if you send them to PRA@fcc.gov. Please do not send completed application forms to this address.

You are not required to respond to a collection of information sponsored by the Federal government, and the government may not conduct or sponsor this collection unless it displays a currently valid OMB control number with this notice. This collection has been assigned OMB control number 3060-0850.



The FCC is authorized under the Communications Act of 1934, as amended, to collect the personal information we request in this form. We will use the information you provide to determine whether approving this application is in the public interest. If we believe there may be a violation or potential violation of a statute, FCC regulation, rule or order, your application may be referred to the Federal, state, or local agency responsible for investigating, prosecuting, enforcing or implementing the statute, rule, regulation or order. In certain cases, the information in your application may be disclosed to the Department of Justice or a court or adjudicative body when (a) the FCC; or (b) any employee of the FCC; or (c) the United States Government, is a party to a proceeding before the body or has an interest in the proceeding.

All parties and entities doing business with the Commission must obtain a unique identifying number called the FCC Registration Number (FRN) and supply it when doing business with the Commission. Failure to provide the FRN may delay the processing of the application. This requirement is to facilitate compliance with the Debt Collection Improvement Act of 1996 (DCIA). The FRN can be obtained electronically through the FCC webpage at <http://wireless.fcc.gov/ula> (click on CORES/CALL SIGN REGISTRATION) or by manually submitting FCC Form 160. FCC Form 160 is available from the FCC's web site at <http://www.fcc.gov/formpage.html>, or from Federal Communications Commission Fax Information System by dialing (202) 418-0177.

This notice is required by the Privacy Act of 1974, Public Law 93-579, December 31, 1974, 5 U.S.C. Section 552a(e)(3) and the Paperwork Reduction Act of 1995, Public Law 104-13, October 1, 1995, 44 U.S.C. 3507.



Cut Along This Line


UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
General Radiotelephone Operator License


ATTN: FELIX RUDIAK
RUDIAK, FELIX
5 CAMBRIDGE ROAD
TENAFLY, NJ 07670

FCC Registration Number (FRN): 0028187797

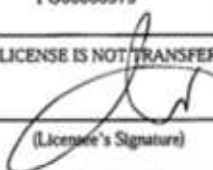
Special Conditions / Endorsements

NONE

Grant Date	Effective Date	Print Date	Expiration Date
01-31-2019	01-31-2019	02-01-2019	

File Number	Serial Number	Date of Birth
0008508859	PG00060979	02-07-1967

THIS LICENSE IS NOT TRANSFERABLE


(Licensee's Signature)

FCC 605-FRC - May 2007

Cut Along This Line

Licensee: This is your radio authorization in sizes suitable for your wallet and for framing. Carefully cut the documents along the lines as indicated.

The Commission suggests that the wallet size version be laminated (or another similar document protection process) after signing. The Commission has found, under certain circumstances, laser print is subject to displacement.

Cut Along This Line


Serial Number	Grant Date	Expiration Date	File Number	Print Date	Effective Date
PG00060979	01-31-2019		0008508859	02-01-2019	01-31-2019

Date of Birth	FCC Registration Number (FRN)	Special Conditions / Endorsements
02-07-1967	0028187797	NONE

ATTN: FELIX RUDIAK
RUDIAK, FELIX
5 CAMBRIDGE ROAD
TENAFLY, NJ 07670

General Radiotelephone Operator License

FCC 605-FRC - May 2007


Signature of Licensee
FEDERAL COMMUNICATIONS COMMISSION

Cut Along This Line

FIRE DEPARTMENT CITY OF NEW YORK 1/19

APPLICATION FOR AUXILIARY RADIO COMMUNICATION SYSTEM COMPANY CERTIFICATE



Submit completed form and all attachments to:
 Executive Director of Licensing
 Bureau of Fire Prevention
 Fire Department – City of New York
 9 MetroTech Center – Room 1S-1C
 Brooklyn, NY 11201-3857



Instructions: This application must be completed by an owner or principal of the company. Please make sure to fill out every field accurately as all fields are required to qualify. Do not leave any fields blank, write "NONE" or "N/A" in fields that do not apply to your company. The complete application should be forwarded to the address above, with a check made payable to the *New York City Fire Department* with the application fee of \$105 for original applications and \$50 for renewal applications in addition to radio fees indicated in Section F. The fees are non refundable. Defective applications may be resubmitted one time within 30 days after FDNY notification without any financial penalty. A new application and fee is required after 30 days. Specific questions can be addressed to pubcert@fdny.nyc.gov or by calling 718-999-1988.

☒ **Original**

☐ **Renewal*** Date Inspected: ___/___/___ (Include Certificate Comp. # ___)

*Must have radios inspected. Attach the affidavit from the radio shop.
 Companies will receive an official letter from the FDNY after review. The approval will not allow you to use the radios for any other purpose than to test the Auxiliary Radio System within a building. Further steps are outlined in RCNY 511-01 and Fire Code Section 511.

Section A – Company Information

Company Name:

Allstate sprinkler Corp

Address: 1869 White Plains rd. City: Bronx State: NY Zip Code: 10462

Public Telephone Number:

1 (718) 597-4060

Fax Number:

1 () N/A -

Name of Owner or Principal Completing Application:

Felix Rudiak

Public Email Address:

felix @allstatesprinkler.com

Certificate of Fitness Number:

Category Type:

Expiration Date:

If your business is located outside of New York City, you must list an Agent for Receipt of Process located in New York City for Judicial OR Administrative Proceedings or Action. (P.O. Box not acceptable, please list a physical mailing address within the five boroughs of New York City that is authorized to receive legal documents if required)

Name: N/A Address: N/A City: N/A Zip Code: N/A

Official Use Only:

Application fee: Original \$105 (CC 62); Renewal \$50 (CC 63)

CERTIFICATE ISSUED BY NYC FIRE DEPT

CERT.# **90207523** N
 ISSUED **02/27/2019** EXPIRES **02/21/2022**

NAME **FELIX RUDIAK**
 HOME **5 CAMBRIDGE RD**
 ADDR. **TENAFLY, NJ 07670**

**NOT
 FDNY
 EMPLOYEE**



FEE \$ 25 CAT. B03 TYPE **Fitness**
 DESC. **AUXILIARY RADIO COMMUNICATION SYSTEM**

EMPLOYER **ALL STATE SPRINKLER CORP**
 WORK
 LOCATION ,

Approved Companies List

Auxiliary Radio Communication System

Friday, March 01, 2019



App No. 121 Approval Exp: 2/27/2020
Company : ALLSTATE SPRINKLER CORP
Address: 1869 WHITE PLAINS ROAD
 Bronx, NY 10462
Telephone #: 718-597-4060
Principal's Name: FELIX RUDIAK
Insurance Exp Date: 12/15/2019

App No. 106 Approval Exp: 1/30/2020
Company : ARCSYS LLC
Address: 165 BEACH 116TH STREET
 Rockaway Park, NY 11694
Telephone #: 718-569-7141
Principal's Name: JASON MIGUEL
Insurance Exp Date: 10/23/2019

App No. 116 Approval Exp: 5/6/2019
Company : C SQUARED SYSTEMS, LLC
Address: 65 DARTMOUTH DR
 Auburn, NH 03032
Telephone #: 603-644-2800
Principal's Name: JOSEPH LESKY JR
Insurance Exp Date: 6/30/2019

App No. 103 Approval Exp: 11/28/2019
Company : CELL SIGNAL SOLUTIONS LLC
Address: 460 FARADAY AVENUE, BUILDING A
 Jackson, NJ 08527
Telephone #: 800-607-5031
Principal's Name: DANIEL HOFFMAN
Insurance Exp Date: 9/13/2019



FDNY

www.nyc.gov/fdny

2/27/2019

ALLSTATE SPRINKLER CORP
1869 WHITE PLAINS ROAD
Bronx, NY 10462

RE: Auxiliary Radio Communication System Company Approval

App No # 121

Exp:

2/27/2020

Ins Exp:

12/15/2019

Dear Felix Rudiak

Your company's application has been accepted to purchase the radios and test Auxiliary Radio Communication Systems provided under Fire Code Section 511 and RCNY 511-01.

This application acceptance is only valid for a period of one year from today's date and must be renewed. Unless your renewal is approved by the FDNY in writing, all servicing activities must cease at the expiration of this period. Therefore, you are advised to submit your application for renewal one month prior to expiration contact the shop 72 hours ahead of time for an inspection. You will not receive any renewal notice.

This acceptance is granted under the following terms:

The official FDNY seal appears at the bottom of this notice.

The company number listed above will be used for all official records.

Termination or modification of the insurance policy will void this approval.

The Fire Commissioner may withdraw this approval for cause at any time upon written notification.

The company agrees to fully comply with the FDNY Administrative Code, RCNY and regulations outline B-03 Study Material.

The company's employees may not wear or display any name, logo, insignia or uniform of FDNY other than displaying a Certificate of Fitness, when required.

All applicants taking the CBT exam must provide a letter of recommendation along with a copy of this approval letter. C of Fs must be returned to the FDNY whenever the individual terminates employment with the listed company.

Yours truly,

Steve Ertrachler

Executive Director of Licensing

5. Plans for Next Project Segment (for interim reports only)

Show on a task-by-task basis the plan for the next project segment. Describe and justify any rescheduling or additions to activities on the Program Plan for the next project segment and indicate which, if any, of the originally planned activities or tasks are being terminated or redirected. Discuss the impact that rescheduled activities are likely to have on the original Program Plan during the next project segment and if additional time will be needed to complete the project.

NOTE: If additional time is needed, a separate written request should be jointly submitted by the companies, stating the justification for the request and the number of months requested. Reference could be made to the project status and plans described in detail in this technical report.

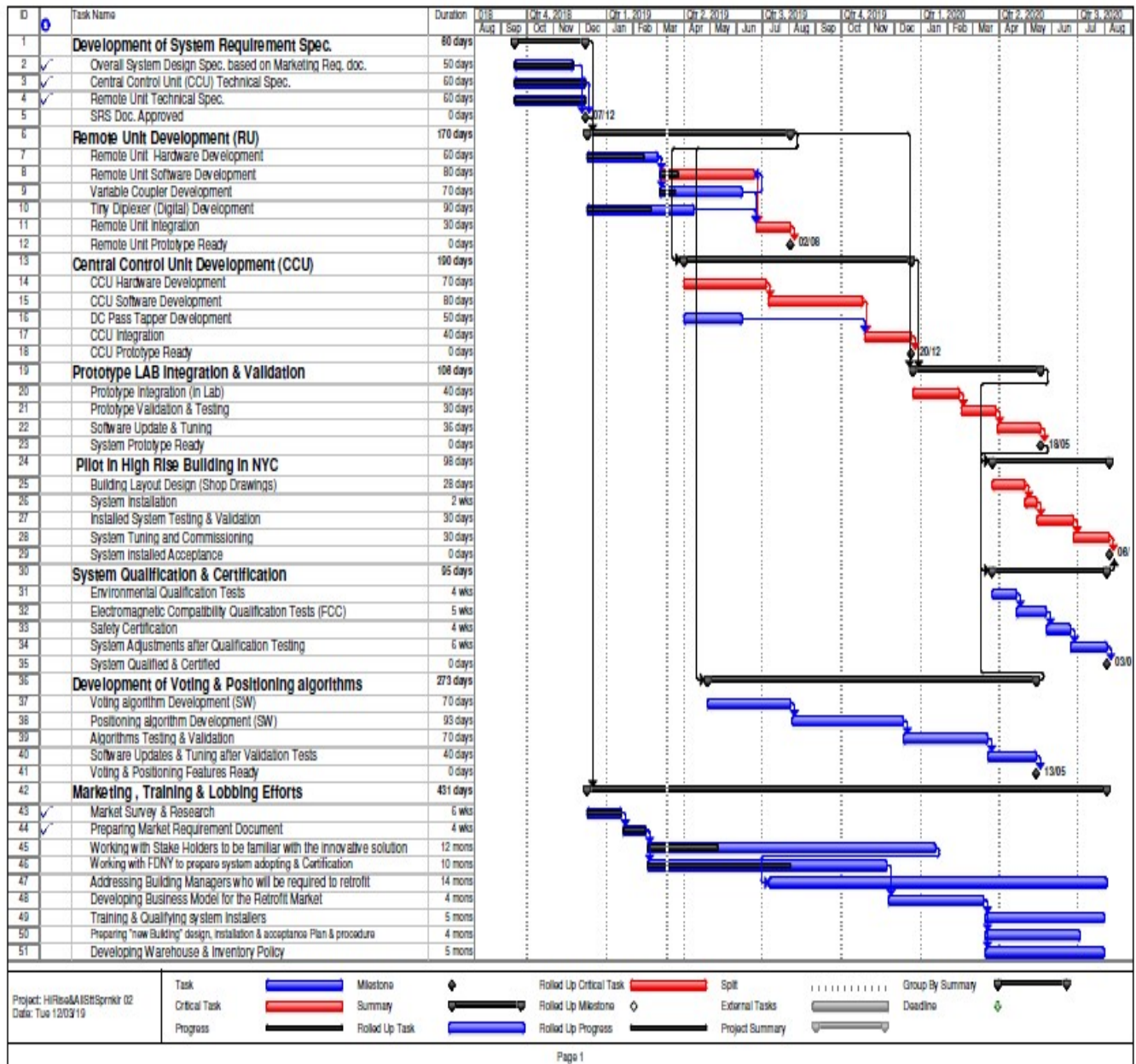
The main efforts for the next six months will continue along the original GANTT and will focus on the following tasks:

1. Completing Task 2 that has been started on design and development of the Remote Unit (RU) that will be mainly led by HiRiseTech with feedback from users and oversight of the design by AllState Sprinklers. The goal is to place RU units in the format of a working prototype that will enable lab test (not yet in building) for the future FRRS integration. This task is progressing according to the initial planned timetable.
2. Starting the development of the Central control Unit (CCU) and reaching at least 50% of its assignments with main leadership by HiRiseTech and customer feedback and oversight by AllState Sprinklers. During the next segment the development of the CCU will be completed and will be constructed in the format of a working prototype that will enable lab test (not yet in building) for the future FRRS integration. This task is progressing according to the initial planned timetable and its completion will enable to reach milestone 3. .
3. Beginning Task 7 of the Development of the Voting and Positioning algorithms that is a main software challenge for the project to be a cooperation between the parties. This central software task will involve full planning and design and the development of detailed configuration and architecture including the development of the algorithms. Testing will require engagement with the RU units that will be evaluate for performance at extreme and harsh conditions.
4. Continue with the progress of Task 8 of Marketing, Training & Lobbying Efforts along the defined sub-tasks. The aim is to reach installment of FRRS system in an existing old building after the profiling and selection of the proper building in which it will be possible to conduct testing and experiments of the system that is under development

6. Graphical Comparison of Actual/Planned Activities Versus Program Plan

Using the Program Plan (Annex D of the CPFA) and the tasks described there, show graphically (Gantt chart, usage of Microsoft Project software is mandatory.) the actual timing and status of project activities (tasks) carried out thus far and explain deviations from the Program Plan. Likewise, use the Gantt chart of the Program Plan to show graphically the revised planned activities (tasks) for the remainder of the project and explain deviations from the Program Plan. (Explain all symbols used in the plan.) For each task, whether it has been completed, is still being carried out, or is planned later on in the project, indicate graphically in a single chart (1) its original program plan timing, (2) its actual occurrence and % completion at the end of the reporting segment, and (3) its planned (and maybe re-scheduled) occurrence in the remainder of the project.

The Gantt Chart below shows that the project is progressing according to the work plan. Task 2 has been completed. Task 3 is in the middle of operation and the first to sub-tasks of Task 9 (marketing) were completed. Next interim report will cover the additional progress



7. Cooperation Between the Companies

Discuss the activities conducted during the reporting segment that have enabled the companies to keep abreast of each other's progress. Has the division of tasks or responsibilities between the two companies been integrated to mutual benefit? Any problems that have developed in this regard should be noted, along with details of corrective measures that have been taken or are planned.

This project is conducted as a cooperative efforts between 1) HiRiseTech from Israel who own the patented technology for the FRRS system for First Responder communication in existing high rise building, and All State Sprinkler that has a network of customers and experience in installing such system at the target marker

The First Responder market is a strategic target for both parties, where HiRiseTech will focus on 2nd generation technology: system design, two-way radio communication, and integration (software and hardware) that is built in Israel first and then moved later to the United States.

Allstate Sprinkler Corp. concentrate on marketing, deployment and after-sales support. Initially Allstate Sprinkler and will serve as the initial single VAR in the New York area developing contacts with its existing customer base. Exposure of the system to this huge customer base is the initial marketing task for the project to foster a rapid sales process providing positive exposure to the system.

These work split has been proven very productive in the first six months of the project where HiRiseTech completed the system design and started with developing the remote unit while AllState Sprinklers focus on customer feedback and requirements, and obtaining the individual and project certification by the New York Fire Department for operating in existing high rise building in New York city.

During this period Mr. Itsick Ben Tolila, The Israel Project Manager and the CEO of HiRiseTech visited the US partner in the beginning of the project during September 2018 to discuss and agree on all the aspects of the project technical design including the composition of the System Requirement Specification (SRS), the design review of the System testing plan (STP), the composition of the Marketing Requirements Document (MRD), and the composition of the integration plan.

Subsequently Mr. Dan Friedman, The Project Manager in All State Sprinkler and Its COO to verify the completion of the MRD, entering into the actual hardware and software of the remote unit components and the discussion on intermediate finding regarding the MRD
In addition the parties conduct weekly discussion for problem solving and project progress.

In addition, AllState sprinkler team has participated in the First Responders Congress of BIRD held in Atlanta in the Fall and presented the project to the large potential customers and stock holders that attended the meeting

Accordingly the parties completed Task 1 of the design and develop of all SPEC documentation and testing plan and procedures and obtained the initial certificate by the New York Fire Department

In the next segments the parties will further cooperate to obtain the regulatory approval from Underwriter Laboratories (UL), based on design and integration already developed in accordance with the required regulatory requirements (N FPA1221).

The work split between the parties is described in the table below with yellow signs marking cooperative activity that has been already accomplished:

Table 1: Areas of Responsibility

Proposed Areas of Activity/Responsibility	Allstate Sprinkler	HiRiseTech
Design (R&D) and Engineering	✓	✓
Two-way radio communication		✓
Software and hardware integration		✓
Pilot in New York high-rise building	✓	
Commercialization of technology for existing high-rise buildings	✓	✓
Obtaining regulatory certificates	✓	✓
UL safety testing	✓	✓
FCC electromagnetic compatibility (EMC) testing	✓	✓
Fire Departments of New York investigation of the system's suitability and commissioning (on going)	✓	✓
Development of sales and support infrastructure	✓	
Customer service and after-sales support	✓	
Safety, and compliance with NPFA fire code requirements	✓	✓

The companies intend to share their existing customer base and establish a network of Value-Added Resellers (VARs) and system integrators who will sell and install the FRRS solution for existing high-rise buildings to ensure geographical coverage in the USA and the rest of the world.

Many discussions were held to fine tune the parties' commercial arrangements which will leverage HiRiseTech's existing network with the relevant stakeholders, and with major developers and real-estate companies. The cooperation between the two entities also leverage on the existing Allstate Sprinkler Corp sales foreseen order to promote the solution to the First Responders market.

The parties have verified the market requirements for a straight forward and affordable solution for existing buildings, in order to comply with the New York Housing Department guidelines. An assessment of the degree of building owners to renew their certificate of occupancy was conducted to identify early adopters who will need to install the FRRS system in order to update their existing communication infrastructures to enable the most flexible, adjustable, rapid and cheap solution while offering sophistication and compliance with the regulatory requirements.

HiRiseTech has received immediate exposure to the Allstate Sprinkler's installed customer base in the Greater New York area which, in fact, is an ideal target audience. The marketing mode is targeting these customers to permit immediate sales relative to the broader potential market.

Reciprocally - Allstate Sprinklers received a technological infusion for expanding its customer base with advanced new concepts.

Benefit to Each Partner from the Cooperative

The system under development is an innovative and creative solution for a real world problem. It is cost effective as it reduces hassle greatly and simplifies what is involved in a building retrofit necessary to meet FDNY and NFPA mandatory requirements.

HiRiseTech is broadening its development capabilities by focusing on 4th generation technology: system design, two-way radio communication, and integration (software and hardware).

Allstate Sprinkler Corp. has concentrated on marketing, deployment and after-sales support. To act as the initial single VAR in the New York area with its existing customer base to expose them to in-depth understanding of the technologies involved.

Important New Development

The Parties has announced their award of the BIRD Foundation Grant

R&D Foundation to Invest \$2 Million in New Projects to Foster Advanced Technologies for First Responders (Cision, PR Newswire, July 31, 2018)

The program was established by the U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) and the Israeli Ministry of Public Security (MOPS) to promote and fund jointly developed technologies for First Responders (PRNewswire, Tel Aviv, Israel, July 31, 2018).

HiRiseTech (Petach Tikva, Israel) and Allstate Sprinkler Corp. (Bronx, NY) will develop a first responders emergency radio repeater system for existing high-rise buildings.

Subsequently, they established cooperation with the fire department of New York (FDNY) for installing a system for first responder emergency radio system solution in the iconic Chrysler building in Manhattan. This site will serve for the study pilot. FDNY wants to specifically check the performance of the system in this building because of its unique features which are of major interest to them – the firefighters' identification and location in the building. If the parties confirm that the system indeed functions as required (at no additional expense to the owner), then there is a good chance that FDNY, as the Authority having Jurisdiction, will require that these features be integrated in any system installed in New York City. Starting from December 2018 this project will facilitate BIRD project pilot installation in New York City.

8. Risk Analysis

TABLE 1A: Main Risks

Risk #	Name/Description	Ranking	Impact		
			Duration ¹	Budget ²	Commercialization Potential ³
1	Meeting the Development Goals	Very Low	Low	N/A	Low
2	Compliance with FCC and UL Standards	Low	Medium	Low	Medium
3	Penetrating the American market	Low	Low	Low	Low
4	Certification by FDNY	Medium	Medium	Low	Low
5	Implementation of smart voting algorithm & First Responder localization	Medium	Medium	Low	Low

TABLE 1B: Explanation of Risks

Risk #	Name/Description	Type*
1	Meeting the Development Goal	T
2	Compliance with FCC and UL Standards	E
3	Penetration of the American market	M
4	Certification by FDNY	E
5	Implementation of smart voting algorithm & First Responder localization	T

Explanation to Risk 1 – Meeting the Development Goal

In a complicated multidisciplinary technological project like this there is always a risk to complete all the technological tasks. The risk here is considered low giving the deployments already implemented in the One World Trade Center in New York that is operating and provides on-going feedback to the current development, as well at the pilot project in the Moshe Aviv Tower in Ramat Gan.

The means to mitigate this risk involved the employment of computerized simulation for each step, making computerized analysis of all issues, building prototypes and their testing using of the shelf and proprietary test equipment. The integrated lab prototype system will emulate as much as possible the operational deployment of the system in High Rise in NY, this will minimize the technical problems that may arise in the Pilot itself in NY.

Explanation to Risk 2 – Compliance with FCC and UL Standards

New York State and fire department regulations drive the development for complete wireless radio coverage for high-rise buildings. Compliance to all of such regulations is critical for solution certification and licensing.

This project design involves the use of these standards, which are incorporated within the SRS and STP and maintaining on-going contact with the respective regulatory bodies including consultation with the former Chief of the Fire Department of New York. The parties have allocated a whole task for this and will utilize major resources and external consultants, present a prototype for each component within the integrated lab system prototype, and conduct preliminary lab evaluation and validation in national labs.

As the nature of such accreditation tends to be slow due to burdens on the certifying units, the potential duration was estimated, from the beginning, to be an extended period, but we anticipate that even if we encounter some delay it will be absorbed within the project time line or at worst there will be a delay of 1 to 2 months and no more (we intend to hire an “expeditor”, familiar with the enforcing department of FDNY in order to expedite the process).

Explanation to Risk 3 – Penetration of the American Market

The American market is currently the most receptive one for project development but it is also known to be conservative when it comes to big project that involve numerous authorities.

The parties will strengthen their existing network of contacts, build business relations with Real Estate building owners, communicate with existing satisfied customers who used the services in the past, and work with a qualified bidder and all stake holders including the regulatory agencies such as the New York Building Department and Fire Department of New York.

The company has already got few POs from strategic customers in NY, and will leverage its reputation, install base, technology advantage, access to the target market in order to further penetrate the US market, starting with NY first.

Explanation to Risk 4 – Certification by FDNY

The major entities that will benefit from this project will be the point of major effort and we will work in closely with the Fire Department of New York to reach its approval for the implementation of the project. FDNY will be thus invited to be involved in the pilot project in New York City and for testing and acquiring hands on experience with the system. The parties will hold training workshop with New York First Responders to get their feedback across the project and familiarize them with its characteristics and benefits.

This project incorporates FDNY standards across its entire development, as incorporated within the SRS and STP and the parties are in on-going contact with FDNY. The parties have allocated a whole task for this and will utilize major resources and external consultants, present a prototype for each component within the integrated lab prototype, and conduct preliminary lab evaluation and validation in national labs.

The parties will closely monitor the pace of standards’ acceptance, the accreditation and certification processes and will regularly meet with all the opinion leaders to familiarize them with the project, get advice and update them on the project according to the developments in the field. As the nature of such accreditation tends to be slow due to burdens on the certifying units, the potential duration was estimated, from the beginning, to be an extended period, but we anticipate that even if we encounter some delay it will be absorbed within the project time line or at worst there will be a delay of 1 to 2 months and no more.

Explanation to Risk 5 – Implementation of the Smart Voting Algorithm and of the First Responder Localization Algorithm.

This is a major challenge given the complex architecture and the number of floors in each building. We will use simulcast and modulation for various types of signals. This is a major element of our planned research, but we are confident that this issue is fully surmountable given the experience gained by the company’s’ leading engineers in challenges like this in different projects. The solution the company has developed for new buildings (single riser solution) will enable us to do almost immediately a lot of tests in order to investigate the behavior of the system in different scenarios and to emulate the behavior of the RF signals when concurrently spread within the building in multiple points.

Updated Marketing Forecast - Cover Page

(Formerly: Final Technical Report - Part II)

BIRD Ref. No.:	3024	
To: The Israel - United States Binational Industrial Research and Development Foundation		
Project Title:	First Responders Emergency Radio Repeater System for Existing High-Rise Buildings	
Submitted By:		
IS Company:	HiRise Tech Ltd	
U.S. Company:	Allstate Sprinklers	
Project Start Date:	1 September 2018	
Development Work Termination Date:		
	Israeli Company	U.S. Company
Project Manager:		
Signature		
Printed Name	Itsick Ben Tolila	Dan Friedman
Title	CEO	COO
E-mail:	ibt@highrisktechnologies.com	dan@allstatesprinkler.com
Telephone no.:	+972-54-3681831	
Authorized Company Official:		
Signature		
Printed Name	Itsick Ben Tolila	Dan Friedman
Title	CEO	COO
E-mail:	ibt@highrisktechnologies.com	dan@allstatesprinkler.com
Telephone no.:	+972-54-3681831	
Date Submitted:	Itsick Ben Tolila	

9. Marketing and Commercialization Plan

Identify any important changes in the market or your plans for commercialization that have developed during the segment covered by the report. Explain such developments and the impact they will have on the overall development program plan and budget, and on the overall commercialization plans and schedule.

As described in the technical report they parties have conducted a market survey and performed the analysis of market requirements (attached as an appendix)

These were presented to the New York Fire Department that has issues a Permit Certificate (attached as an appendix) that allows the installment of **First Responders Emergency Radio Repeater System for Existing High-Rise Buildings** in the city of New York, an achievement that was initially anticipated to be gain only by end of the first project report

The market prospect for the FRRS project in New York City is huge given the very large number of high-rise buildings in the city that require effective radio coverage system for First Responders. It is estimated that there are 7,500 high-rise buildings in New York City alone and more than 390,000 low-rise buildings (75-125 feet) globally. ²

The revenue stream of meeting this potential is anticipated to exceed \$1 billion. As there are 30 metropolitan cities in the U.S. with a population greater than 1 million, the actual estimated market for the USA alone, for FRRS, is estimated to range between \$3 and \$5 billion. The global market is estimated at more than \$10 billion. The parties will commercialize the building blocks, the integrative solution, the testing and calibration tools to a network of trained and certified VARS, which will install the FRRS solution in existing buildings. The proposed solution is cheaper, elegant and infrastructure independent compared to competitors.

Served Market Needs

The HiRiseTech/Allstate Sprinkler Corp. project will address a fraction of the First Responder market, i.e. the market segment of high-rise building, 15 floors and above (135 feet), while ignoring the larger market segment of buildings below 15 floors and of that of new buildings. Accordingly, we will concentrate on a market of approximately \$3 billion. It is estimated that this market size is fixed and is not expected to grow.

Expansion to the buildings of 9-15 floors and above 75 feet is anticipated but not included in the market calculation as it is beyond the project plan and may need additional adaptation.

Also, the sales forecast does not address new buildings for which the technological solution is rather different.

The proposed project offers an innovative solution accounting for a slow rate of penetration given the existing competitors. Yet, the model assumes growing from the slow early penetration to a later exponential growth. Accordingly, in the first 3 years post product launch (anticipated in the second half of 2020) market volume is anticipated to be relatively small, but it is expected to grow in 2021 and 2022. Estimated sales for the corresponding years are \$2 million, \$10 million and \$20 million for 2020, 2021 and 2022, after project completion, with accumulated revenues of \$32 million. Geographically the focus will be New York City operation that the parties will establish together leveraging the existing and well established customer base of Allstate Sprinkler Corp.

² <http://www.emporis.com/city/newyorkcity-ny-usa>

Anticipated product performance, sale price, test cost

We estimate that the sale price of individual project components, design, and licensing will be in the range of \$10-15 thousand per building. This involves the cost of system and includes all elements from both companies.

As we aim to start in the second half of 2020, then the number of systems to be sold (number of buildings for installation is estimated to grow from 20 systems in 2020 to 100 in 2021, 200 (2022), 280 (2023), 350 (2024) and 420 (2025).

Market coverage will increase from 0.07% in 2020 to 1.82%

The corresponding sales volumes for the number of installments of 2020-2025 are \$2M, \$10M, \$20M, 33.6M, \$42M, and \$54 million, respectively, with accumulated revenues of \$162.220 M.

Sales will mainly be promoted from a New York facility that the parties will establish together leveraging on the existing network of Allstate Sprinkler Corp. The definition of offerings and component transfer prices will be priced accordingly.

The last three years in the following table present sales beyond the New York City area, penetrating to additional geographical markets such as Chicago and Miami.

Table 2: Updated Market and Sales Estimates (see MRD Task 8)

Calendar Year	2020	2021	2022	2023	2024	2025
Target Market size for the System	3,000	3,000	3,000	3,000	3,000	3,000
Estimated Market Share (%)	0.07%	0.33%	0.67%	0.84%	0.933%	1.12%
Estimated Sale Quantity (Systems)	20	100	200	280	350	420
Estimated Representative System Price Sale (\$/System)	\$100,000	\$100,000	\$100,000	\$90,000	\$80,000	\$80,000
Estimated Sales Revenues (\$)	\$2,000	\$10,000	\$20,000	\$25,200	\$28,000	\$33,600
Estimated Cumulative Sales (\$)	\$2,000	\$12,000	\$32,000	\$57,200	\$85,200	\$118,800

Overall Market Potential by Country/Geography

A market research document created by Market and Market is termed "Public Safety in Building Wireless DAS System Market." The Survey provides information based upon System Components (antennas, cabling, distributed antenna system (DAS) head-end and remote unit and repeaters), Service (professional and managed), Applications and Region. A global forecast for 2021 predicts a \$10 billion market of which \$5 billion is in the USA alone. The disruptive market is expected to grow rapidly with a CAGR of 33.9% from 2016 to 2021.

Construction and building management: In New York City there are almost 7,500 high-rise buildings.

Schools and universities: There are 2,600 colleges and universities and 100,000 schools in the United States.

Critical infrastructures: There are 5,000 airports in the U.S. with paved runways. 376 airports have regularly scheduled airline service. Other targets include nuclear power plants, the national electric grid, water reservoirs, tunnels, bridges and many more.

Retail and shopping malls: 1,100 shopping malls are categorized as enclosed malls in the US.

A rough estimate of the target high-rise building market in the United States is provided in the following table.

Table 3: Updated Potential Market (See MRD Task 6)

Location	Number of High-Rise Buildings	Potential Value
New York City	6,000	\$650 million - 1.3 billion
30 other major US cities	18,600	\$1.86 - 3.72 billion
Total		\$2.5 - 5 billion

The above table represents the total market estimate for high-rise building communication systems for First Responders. The estimated global market volume is \$2.5-5 billion, of which a major chunk is potential income from deployment in old high-rise ones while the remaining is in new buildings.

Anticipated Market Share for 12 Months Post Project End

The parties are focusing on the commercial market in the United States where the need for First Responder communications systems has been recognized by the fire departments and other agencies. It is a very lucrative market.

First-Responder high-rise in-building communications involves providing a cost-effective system that can easily be deployed with very limited modifications to the building. High-Rise Tech is targeting a huge number of high-rise buildings erected in the first 80 years of the 20th century.

The U.S. market entry strategy focuses on Allstate Sprinklers providing solid contacts from their existing customer base in New York and the establishment, by Allstate Sprinklers, of a network of VARs and system integrators that will ultimately provide full geographical coverage of the United States.

The table of project sale forecast presented in section 7 above includes estimates of the market share for the years after the project ends. Accordingly, the forecast is 0.07% for 2020, 0.33% for 2021, 0.67% for 2022, 0.84% for 2023, 0.933% for 2024, and 1.12% for 2025.

It is important to note that there is an additional system for wireless radio communications for First Responder for new buildings. This solution is not part of this project and thus has not been included here.

Customer Characteristics

The U.S. market penetration strategy relies on cooperating with a nationwide equipment supplier that will provide leads to their customer base as well establishing a network of VARs and system integrators who will ultimately provide full territory coverage of the United States.

This market presents large sales opportunities relying on traditional sales channels such as the customer base and sales channels of Allstate Sprinkler Corp's., and HiRiseTech's representatives' network.

The pilot system that will be installed funded by the BIRD project will allow us to demonstrate the system features, capabilities and strength in bi-directional signal transmission, the command control between the Remote Units, the CCU, and the accuracy of the positioning and network algorithms for First Responder localization. This pilot interfaces with RF signals and control from the Master Head-End (MH) radio rooms via a site wide Distribution Network (SDN) and First Responder portable radios will show the quality of the proposed system. In addition, the system provides channel control, recording and audio interface points for the New York City Fire Department from Radio Fire Command Station (RFCS) locations.

The market penetration model is built on VARs sales channel that specialize in installation of wireless system and fire protection networks in buildings. These VARS will be trained and certified by the project partners. The number of such VARS will be limited, in order to increase the exposure. We will be presenting in trade shows such as NT Building at the Javitz Center.

The plan calls for cooperation with partners such as BelAir Electric who are experienced electrical contractors for these type of system installations in the New York region.

Other customers include:

- Real Estate Developers such as Silverstein, Durst, Ashkenazi, with whom the partners have had prior business relationships.
- General Contractors such as Tishman who worked with the partners in the past.
- Low Voltage contractors who routinely participate in providing such turnkey solutions.
- Installers such as Five Stars, Zwicker, H&B and Belair who have worked with the partners in the past,
- Fire protection companies like FireCom,
- Distributors of communication systems such as Comtarn, NAMS, RF Solutions, Zaharoni, etc.

Barriers to Market Penetration

The barriers can be divided into technological challenges and market/certification ones.

The First Responder radio communication market began roughly 12 years ago, after the review of the September 11 attacks. One of the key conclusions was that the reason behind the vast loss of life among the First Responders was due to the shortcomings of their radio communication system which lacked the ability to communicate between the rescue teams located on various floors throughout the buildings and the command centers as well as amongst the teams themselves, it took more than a decade until the lesson learned from 09/11 become part of the Code!

Considering the nature of the problem, this area is filled with multiple standards and certification requirements.

The current solutions offered by major competitors are costly as outlined in the next section (G7), and also requires significant investment in construction.

The normal high cost of regular maintenance of a high-rise building in any event and the fact that these buildings have tenant who are naturally sensitive to disruptions caused by constructions present resistance to adoption and major impediments.

Although positioned as a high-end solution, the proposed project system is cheaper components wise and installation costs. The solution enables the present, archaic market of First Responder telephony to evolve into a modern wireless solution and meet the NPFA standard.

It is estimated that the market will progress along with building permit periodic renewal which will require implementation of a First Responder solution as already is the case for the City of New York. The market is anticipated to expand to other major cities such as Washington DC, Los Angeles, Boston, Chicago and others which are quick adapters. Furthermore, there are several obsolescence clauses that have been included in fire regulations that demand the replacement of antiquated communication systems by FRSS solutions.

The system shelf life is anticipated to be 10-20 years. This estimate is derived from the known system life time in emergency forces communication.

There are also technological challenges of providing communications in building where GPS communication is difficult to accomplish.

The first challenge is to reach compliance with NFPA standard 1221 and the specific authorized jurisdiction in each region.

The second challenge is compliance and certification by the local authority in charge, such as the Fire Department of New York and components certification of compliance meeting the FCC standard. **This has been already achieved!!!**

In the long run, all products will need to comply with the UL standard requiring their listing on the UL list. This is anticipated to be a future standard requirement.

The partners aim to obtain FCC certification, using components that already comply with this standard. Such components have met rigorous requirements in regard to Radiated Emission standards.

In addition, the project aim is rely on the FDNY as the enforcer of the regulation.

Subsequently, the partners will have to reach nationwide certification via the UL accreditation, meeting the standard via the certified laboratory in Chicago during the second year of the project.

Nature of the Competition

The proposed system has a clear advantage over larger players such as Corning (Optical Communications), CommScope, and Axell Wireless which are presently offered by Distributed Antenna Systems (DAS) solution providers who are the main competitors. They have several major disadvantages. Deployment costs for these DAS for the smallest high-rise building will cost millions of dollars and, in all cases, installation from scratch and the inconvenience for the tenants will be significant. Deployment in a 40-story building will involve 3 to 4 months relative to 1 week for the proposed FRSS system.

In fact, these companies highlight deployments in new buildings and avoid dealing with the difficulties of installing a DAS system in existing structures.

The following companies are all involved in DAS development: Connectivity Wireless Solutions, COBHAM, (Axell Wireless), Corning (Optical Communications), and CommScope Inc.

Small players (resellers/installers) will find it difficult to independently put together a complete package meeting requirement of the FDNY, City Hall and other legislative and regulatory bodies. Only a few companies have truly hands-on experience like HiRiseTech (Bank of America Tower

and 1WTC project), contacts with key players, or are able to provide a low-cost, modular, customizable solution with a full set of professional services.

Table 4: Information about Competition

Name and Link	System Cost	Competing Product Name	Market Share
Cobham Wireless http://cobhamwireless.com/products/coverage/us/public-safety-off-air-repeaters-usa/700-800mhz-usa/	\$60,000 per one component	D-MBR Series	15%
Comscope www.commscope.com/Docs/Public-Safety-DAS-System-AN-319096-AE.pdf	Approx. \$220,000	Public Safety DAS	10%
TowerIQ Inc. https://toweriq.nyc/	\$120,000 - \$180,000	ARCS	20% (NYC only)

HiRiseTech is the **only company in the market that is developing a solution for existing buildings**. All the other systems, existing or planned, are intended for new buildings and involved a major installation process.

10. Published Material -

Attach a copy of any reprint (not submitted in a previous report) that is based, in whole or in part, on the work conducted in the BIRD project. Include a report on any inventions or patents filed. Technical and user manuals do not have to be submitted.

Addendum to First-Responders Emergency Radio Coverage System for



Addendum to
HiRiseTech Business F

High-Rise Buildings